CLAIMS

1. A laminate package for an energy storage device having two terminals, the package including:

an inner barrier layer for defining a cavity to contain the energy storage device, the inner barrier layer having two opposed portions that are sealingly engaged with each other and from between which the terminals extend from the cavity;

a sealant layer being disposed intermediate the inner barrier layer and the terminals; and

an outer barrier layer bonded to the inner barrier layer and having a metal layer.

2. A package according to claim 1 wherein the sealant layer is Nucrel™ resin containing between about 5% and 10% ethylene acrylic acid.

3. A package according to claim 2 wherein the sealant layer contains about 6% to 9% of ethylene acrylic acid.

4. A package according to claim 1 wherein the sealant layer contains one of: one or more maleic anhydrides; maleic acid; one or more anhydride grafted polyolefins; and one or more acid modified polyolefins.

5. A package according to claim 1 wherein the metal layer includes an aluminium sheet.

6. A package according to claim 5 wherein the aluminium sheet is less than 30 μm thick.

7. A package according to claim 5 wherein the aluminium sheet is less than 25 μm thick.

8. A package according to claim 5 wherein the aluminium layer is less than 20 μm thick.

9. A package according to claim 1 wherein the outer barrier layer includes a first plastics layer bonded to the outside of the metal layer.

10. A package according to claim 9 wherein the plastics layer is PET.

11. A package according to claim 9 wherein the plastics layer is less than 40 µm thick.

12. A package according to claim 9 wherein the plastics layer is less than 30 µm thick.

13. A package according to claim 9 wherein the outer barrier layer includes a second plastics layer bonded to the inside of the metal layer.

14. A package according to claim 13 wherein the second plastics layer is selected from the group consisting of: PET; polyamide; polyvinylidene chloride (PVdC); and polypropylene (PP).

15. A package according to claim 13 wherein the second plastics layer is less than about 20 µm thick.

16. A package according to claim 13 wherein the second plastics layer is less than about 15 µm thick.

17. A package according to claim 13 wherein the inner barrier layer includes a third plastics layer that is bonded to the inside of the outer barrier layer.

18. A package according to claim 17 wherein the third plastics layer is heat sealable and is selected from the group consisting of: PVdC; and polyethylene (PE).

19. A package according to claim 17 wherein the third plastics layer is less than about 40 µm thick.

20. A package according to claim 17 wherein the third plastics layer is less than about 30 µm thick.

21. A package according to claim 1 wherein the outer barrier layer and the inner barrier layer include a first melting point and a second melting point respectively, where the first melting point is higher than the second melting point.

22. A package according to claim 1 wherein the package is formed from a single sheet of laminate material that is folded along its length so that the inner barrier layer is inner-most.

23. A package according to claim 22 wherein at least three of the edges of the folded sheet are abutted and heat sealed.

24. A package according to claim 1 wherein the package is formed from two separate opposed sheets of laminate which are abutted and heat sealed about their entire adjacent peripheries.

25. A package according to claim 1 wherein the thickness of the laminate in the portions containing the sealant is less than 100 μm.

26. A package according to claim 1 wherein the terminals are aluminium and have a thickness of at least 50 μm.

27. A package according to claim 1 wherein the terminals have a thickness of at least 100 μm.

28. A package according to claim 1 wherein the terminals have a thickness of about 500 μm.

29. A package according to claim 1 wherein the terminals are heated to assist the heat sealing of the inner barrier layers.

30. A method of producing a laminate package for an energy storage device having two terminals, the method including:

defining, with an inner barrier layer, a cavity to contain the energy storage device, the inner barrier layer having two opposed portions that are sealingly engaged with each other and from between which the terminals extend from the cavity;

disposing a sealant layer intermediate the inner barrier layer and the terminals; and

bonding an outer barrier layer to the inner barrier layer, the outer barrier layer having a metal layer.

31. A laminate package for an energy storage device having two terminals, the package including:

an inner barrier layer for defining a cavity to contain the energy storage device;

a sealant layer being disposed between, and being sealing engaged with, the inner barrier layer and the terminals; and

an outer barrier layer bonded to the inner barrier layer and having a metal layer, wherein the package sealingly contains the energy storage device and the terminals are accessible from outside the package for allowing external electrical connection to the energy storage device.

32. A package according to claim 31 wherein the outer barrier layer and the inner barrier layer include a first melting point and a second melting point respectively, where the first melting point is higher than the second melting point.

33. A method of forming a laminate package for an energy storage device having two terminals, the method including:

containing the energy storage device in a cavity defined by an inner barrier layer;

disposing a sealant layer between, and in sealing engagement with, the inner barrier layer and the terminals; and

bonding an outer barrier layer to the inner barrier layer that has a metal layer, wherein the package sealingly contains the energy storage device and the terminals are accessible from outside the package for allowing external electrical connection to the energy storage device.

34. A laminate package for an energy storage device having two terminals, the package including:

an inner barrier layer for defining a cavity to contain the energy storage device, the inner barrier layer having a first melting point;

a sealant layer being disposed between, and being sealing engaged with, the inner barrier layer and the terminals, the sealant layer having a second melting point that is less than the first melting point; and

an outer barrier layer bonded to the inner barrier layer and having a metal layer, wherein the outer barrier layer having a third melting point that is greater than the first melting point.

35. A method for producing a laminate package for an energy storage device having two terminals, the package including:

defining, with an inner barrier layer, a cavity to contain the energy storage device, the inner barrier layer having a first melting point;

disposing a sealant layer between, and being sealing engaged with, the inner barrier layer and the terminals, the sealant layer having a second melting point that is less than the first melting point; and

bonding an outer barrier layer to the inner barrier layer, wherein the outer barrier layer has a metal layer and a third melting point that is greater than the first melting point.

36. A laminate package for an energy storage device having two terminals, the package including:

an inner barrier layer for defining a cavity to contain the energy storage device, the inner barrier layer having a first melting point;

a sealant layer being disposed between, and being sealing engaged with, the inner barrier layer and the terminals, the sealant layer having a second melting point that is less than the first melting point; and

an outer barrier layer bonded to the inner barrier layer and having a metal layer, wherein the outer barrier layer having a third melting point that is greater than the first melting point.

37. A package according to claim 36 wherein the sealing engagement between the sealing layer and both the terminals and the inner barrier layer is affected by thermal means.

38. A package according to claim 37 wherein the thermal means applies thermal energy to the package to soften the sealant layer preferentially to the inner barrier layer.

39. A package according to claim 38 wherein the application of the thermal energy softens the inner barrier layer preferentially to the outer barrier layer.

40. A package according to claim 37 wherein the sealing engagement is also affected by the combination of the thermal energy and compressive forces being applied to the layers.

41. A method of producing a laminate package for an energy storage device having two terminals, the method including:

defining a cavity, with an inner barrier layer, to contain the energy storage device, the inner barrier layer having a first melting point;

disposing a sealant layer between, and being sealing engaged with, the inner barrier layer and the terminals, the sealant layer having a second melting point that is less than the first melting point; and

bonding an outer barrier layer to the inner barrier layer, wherein the outer layer has a metal layer and a third melting point that is greater than the first melting point.